Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

RESTORATION OF DIADECTES

E. C. CASE
University of Michigan, Ann Arbor, Mich.

In 1905 the writer published in the *Journal of Geology* (Vol. XIII, No. 2) a description and discussion of the genus *Diadectes* Cope, based on several specimens forming part of the collection of the University of Chicago, and especially upon specimen No. 1075. More prolonged study and the discovery of several additional specimens make it possible to attempt a restoration. It is unfortunate that the species to which this specimen belongs cannot be determined. The specific characterization of members of this genus has been made entirely upon the teeth, and in this specimen the jaws are so tightly closed that their form cannot be made out. The only parts of the restoration not based upon No. 1075 are the feet, the distal ends of the lower-limb bones, the exact form of the posterior lumbar ribs, and the number of the caudal vertebrae. The form and proportions of the lower-limb bones have been determined from other specimens, and the shortness of the tail has been verified. The general character and proportions of the feet are also known from other specimens, as is the exact shape of many of the bones composing them; it is probable that the feet are somewhat too small in the restoration.

The restoration is one-sixth natural size; the animal, it is thus seen, was not far from three feet, six inches in length. This is by no means the largest representative of the genus, since another specimen known to the writer is nearly one-third larger.

The skull is relatively large and clumsy, set closely on the heavy spinal column, with practically no neck. It is noticeable that the heavy lower jaws hang as low as the sternum, giving the animal a bodily habit strikingly like that of the Stegocephalia. The vertebral column is very heavy, and its vertebrae are closely interlocked. The ribs are broad and heavy in the thoracic region, and are found on all the presacral vertebrae, even the atlas. No abdominal ribs have been found in any specimen of the genus, nor of the related genus

Empedias, but it seems very probable that they were present, both because of the prone attitude of the animal, and of its probable ancestral position as regards the Chelonia. It will be of the utmost interest to determine the presence and form of the abdominal ribs, if there be such.

The limbs are remarkably stout and short, with prominent rugosities for the attachment of powerful muscles. The feet are less well known, but the form of the known carpal and tarsal bones, and the shape of the phalanges, indicate a loosely knit foot, relatively broad and clumsy. The general form of the carpal and tarsal bones seems to have been similar to that of the Pariotichidae and the Pelycosauria, though much less perfectly modeled. The terminal phalanges are short and semicircular, covered with strong rugosities (see *Journal of Geology*, Vol. XI, No. 4, Fig. 6, p. 400); it is evident that there were no powerful claws, as in the pelycosaurs, but rather broad and clumsy ones. The most remarkable feature of the skeleton is the presence of plates overlying the first five dorsal ribs. As shown in Fig. 2, the first of these is very small, the second one far larger, and the succeeding three relatively narrow and high. They overlie the ribs directly,

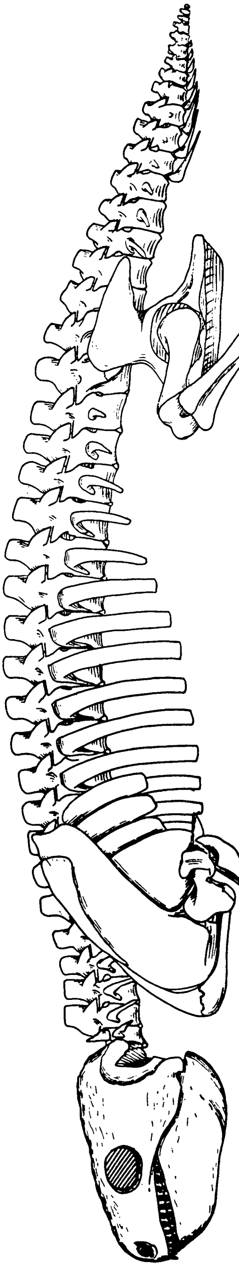

FIG. 1.—Restoration of *Diadectes*, sp., based on specimen No. 1075, University of Chicago collection. The feet are based on imperfect feet of other specimens. × ⅛.

and overlap each other from before backward. Two specimens show the presence of these plates in the position of the restoration, but there are no traces of others on the sides of the ribs or on the summits of the neural spines.

The position of the plates below the scapula is anomolous but there seems no escape from the conclusion that they are restored in the natural position; if the animal was very broad and low, grotesquely so, then the pectoral girdle might have touched only the outer ends of the ribs and the plates might have lain above the girdle; but the condition of the specimen forbids such a conclusion. The pectoral girdle is exceptionally well preserved and free from distortion, the bones are closely articulated and in their proper positions; the whole pectoral girdle has the form of a narrow U with the bottom forward. In fact the animal was distinctly narrow chested. There seems no possibility that crushing could have forced the plates into this position. This is perhaps one of the greatest arguments against the position of the Diadectids as ancestral to the turtles. Cope describes the pectoral girdle of *Otocoelus* and *Conodectes* as internal to the dermal plates which are however much larger proportionally than in the Diadectids.

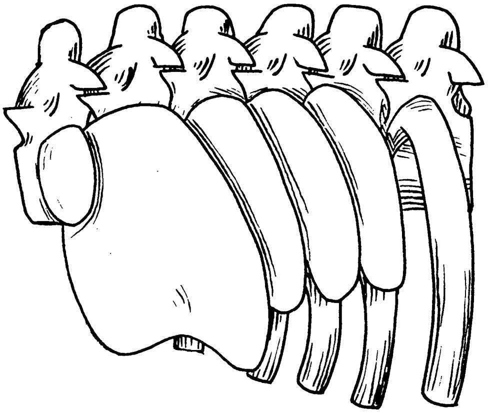

FIG. 2.—Six anterior dorsal vertebrae of *Diadectes*, sp., showing the form and position of the plates overlying the ribs. Specimen No. 1075, University of Chicago collection. ×⅓.

The assemblage of characters shown in the restoration seems to bear out the suggestion made in the previous paper (*loc. cit.*) that the Diadectids are perhaps the nearest to the turtles of the forms now known. The powerful head and jaws, with their numerous testudinate characters, the strong thoracic guard formed by the great scapula with its clavicle, cleithrum, and interclavicle; the short, powerful limbs; the loosely knit splay feet, with their ill-developed terminal phalanges, all give an impression of a compact body lying close to the ground, and moving with a sprawling gait, much as in the turtles. The compactness of the body and the strong limb-bones led Cope to suggest that these animals were perhaps fossorial; but the character of the feet seems to preclude any such possibility. They must have been more like the great stegocephalians, but without their carnivorous habits—lowly, sluggish, inoffensive herbivorous reptiles, clad in an armor of plate to protect them from the fiercely carnivorous pelycosaurs.